# 7.06 Depreciation Example & Other Depreciation Methods

To review the basic methods of depreciation, let's use the following example of a machine, and calculate depreciation expense for each of the **first 2 years**:

| | |
|---|---|
| Purchase date | 1/1/X1 |
| Cost | $1,000 |
| Estimated useful life | 5 years |
| Estimated salvage value | $100 |
| Estimated total output | 1,000 units |
| 20X1 output | 250 units |
| 20X2 output | 300 units |

**Straight-line (SL) depreciation** allocates the depreciable basis (cost – salvage) over the useful life:

- 20X1 Cost 1,000 – Salvage 100 = Basis 900 / Life 5 years = $180
- 20X2 Cost 1,000 – Salvage 100 = Basis 900 / Life 5 years = $180

**Units of Production (UOP) depreciation** multiplies the basis by a fraction whose numerator is the current output and whose denominator is the estimated total output.

- 20X1 Basis 900 × Current Output 250 / Total Output 1,000 = 225
- 20X2 Basis 900 × Current Output 300 / Total Output 1,000 = 270

**Sum of Years Digits (SYD) depreciation** multiplies the basis by a fraction whose numerator is the number of the years left in the life of the asset as of the beginning of the year and whose denominator is the sum of the number of years in the life of the asset.

- 20X1 Basis 900 × Ratio 5 / (1+2+3+4+5) = 900 × 5 / 15 = 300
- 20X2 Basis 900 × Ratio 4 / (1+2+3+4+5) = 900 × 4 / 15 = 240

**Double-Declining Balance (DDB) depreciation** multiplies the book value (cost – accumulated depreciation) at the beginning of each period by a fraction that is double the straight-line depreciation rate.

- 20X1 Cost 1,000 × Multiplier 2 / SL rate 5 = 1,000 × 2 / 5 = 400
- 20X2 Cost 1,000 – A/D 400 = Book value 600 × 2 / 5 = 240

Other declining balance approaches work the same way as the double-declining balance approach, except that the multiplier of the straight-line rate is different.

**Partial period depreciation** – In computing depreciation expense for partial periods, it is necessary to determine the depreciation expense for the full year and then to prorate the depreciation expense between the two periods involved. Continue this process throughout the useful life of the asset.

When an asset is bought on some date other than the beginning of the fiscal year, depreciation in the year of acquisition needs to consider the fractional time period for all methods except the UOP method (which is based on output rather than the passage of time).

Assume the same facts applied as in the previous example, except that the purchase date was later in the year:

| | |
|---|---|
| Purchase date | 7/1/X1 |
| Cost | $1,000 |
| Estimated useful life | 5 years |
| Estimated salvage value | $100 |
| Estimated total output | 1,000 units |
| 20X1 output | 250 units |
| 20X2 output | 300 units |

Since the asset was purchased in the middle of the year, first year depreciation is based on one-half of a year, and the second year is affected as well:

**SL depreciation:**

- 20X1 Cost 1,000 – Salvage 100 = Basis 900 / Life 5 years × ½ = $90
- 20X2 Cost 1,000 – Salvage 100 = Basis 900 / Life 5 years = $180

**UOP depreciation:**

- 20X1 Basis 900 × Current Output 250 / Total Output 1,000 = 225
- 20X2 Basis 900 × Current Output 300 / Total Output 1,000 = 270

**SYD depreciation**:

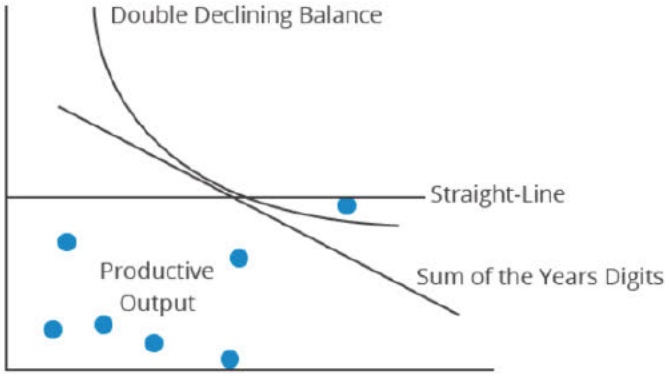
- 20X1 Basis 900 × Ratio 5 / (1+2+3+4+5) × ½ = 900 × 5 / 15 × ½ = 150
- 20X2 Basis 900 × Ratio 4.5 / (1+2+3+4+5) = 900 × 4.5 / 15 = 270

Note: Using SYD, the numerator is the amount of life remaining at the start of the year. For a 5-year asset that is 6 months old, the remaining life is 4.5 years at the start of the second year.

**DDB depreciation:**

- 20X1 Cost 1,000 × Multiplier 2 / SL rate 5 × ½ = 1,000 × 2 / 5 × ½ = 200
- 20X2 Cost 1,000 – A/D 200 = Book value 800 × 2 / 5 = 320

## Charting the Results




## Group or Composite

- Depreciate as a group (eg, a fleet of trucks)
- *Group* refers to a collection of assets that are *similar* in nature, fairly homogeneous and have approximately the same useful lives.
- *Composite* refers to a collection of assets that are *dissimilar* in nature, fairly heterogeneous and have different lives.
- Problem occurs when you sell one of the assets in the group. Accumulated depreciation is not known.
  - Assume cash received = carrying value
  - Assume no gain/loss
  - Plug accumulated depreciation

| | | | |
|---|---|---|---|
| Cash | 20 | | plug |
| Accumulated Depreciation | 80 | | |
| Loss | NONE | | 20 = BV |
| Asset | | 100 | |
| Gain | | NONE | |

Under the *composite method* of depreciation, a building that is furnished with tables, chairs, and other items might elect to determine a weighted average life for all the furnishings, and depreciate the total over this life. In the first year, the company determines the individual depreciation amounts for the items, totals them, and then divides this amount into the total cost to determine an average life that is then used from that point forward.

Assume a company acquires a desk, chair, and lamp to furnish an office and that these items will be of approximately equal usefulness each year, with no salvage at the end of their individual lives:

| Item | Cost | Estimated life in years | Annual depreciation |
|---|---|---|---|
| Desk | $1,000 | 10 | $100 |
| Chair | 200 | 5 | 40 |
| Lamp | 100 | 4 | 25 |
| Total | $1,300 | 7.88 | $165 |

Under the composite approach, the furnishings for the room are carried on the depreciation schedule at a single cost of $1,300, and depreciated over a life of 7.88 years ($1,300 / $165).

Of course, this example doesn't show the value of the composite method, which often involves hundreds of items being depreciated together instead of separately. The savings in bookkeeping effort can be enormous.

If this method seems strange, consider that it is being used in almost all depreciation already. An automobile, for example, includes an engine, transmission, axle, belts, and other parts that don't all have the exact same life, yet an automobile is depreciated as a single asset. This is a form of the composite approach.

## Appraisal or Inventory Method of Depreciation

This method is rarely used. Under this approach, an estimate is made at the end of each year of the value of the assets, and sufficient depreciation expense is recorded to reduce the carrying value to that amount. Since this approach doesn't systematically match costs to benefits, it is only used when the loss in value is directly related to productivity, such as for property being rented to others.

## Depletion

While assets like property, plant, and equipment have limited useful lives, some assets get used up. Mining companies and others in what are referred to as *extractive industries* will buy, or otherwise obtain rights to real property that is expected to have some natural resource, such as *oil, minerals, precious metals, or other commodities.*

When property with a natural resource is acquired, the cost is allocated to the property and the natural resource based on their relative estimated fair values. As the natural resource is extracted from the property, the cost is transferred from the natural resource to inventory and, ultimately, to cost of sales when the inventory is disposed of.

Depletion is recognized each period in a three-step process that is similar to the process used to calculate depreciation and is also often referred to as the **activity method**.

1. The total volume of the resource is estimated
    - The volume is measured in terms of number of units such as barrels of oil, tons of coal, or cubic feet of natural gas
    - In the initial period, the estimate will be the total of the estimated reserves

- In subsequent periods, it will be the estimated amount remaining as of the beginning of the period, which includes the amount extracted during the period plus the amount estimated to be remaining at the end of the period.

2. The total volume is divided into the remaining cost, referred to as the **depletion base**, to get a cost per barrel, ton, cubic foot, or other unit.
   - In the initial period, this will be the total amount allocated to the resource (Cost + additional costs + restoration costs – Salvage/Residual value)
   - In subsequent periods, it will be the carrying value of the resource, which will be the original amount minus any depletion taken in previous periods.
3. The amount per unit is multiplied by the amount extracted during the period to determine the depletion for the period.

$$\text{Depletion} = \frac{\text{Depletion base}}{\text{Total volume at the beginning of the year}} \times \text{Units Extracted}$$

As the natural resource is extracted, the depletion represents the cost of the resource itself. The depletion, along with other direct costs such as labor and overhead, are reported as inventory. Once the inventory is sold, the cost is transferred from inventory to cost of sales.

- An entity in the oil and gas industry may incur costs when evaluating property to determine whether a sought natural resource is present and to develop an estimate of the volume. These costs, referred to as **exploration costs**, may be accounted for in one of two ways: Under the **full-cost approach**, all exploration costs are capitalized and become part of the cost of depleted resources that are found. As a result, depletion includes all these costs.
- Under the **successful efforts approach**, exploration costs are attributed separately to each property and only those that yield an extractable resource are capitalized.
  - Exploration costs attributable to unsuccessful efforts are recognized as expense in the period.
  - Exploration costs attributable to successful efforts become part of the cost included in the depletion base.

Amortization, depreciation, and depletion, like many areas of accounting, require the use of numerous estimates. These include estimates used in allocating costs when assets are acquired, estimates of salvage values and useful lives of property, plant, and equipment and certain intangibles, and estimates of volumes of remaining reserves of natural resources. These estimates are subject to scrutiny every period and, as they change, they are accounted for as changes in accounting estimates. As such:

- Prior period financial statements are not adjusted
- The new estimate is applied prospectively, in the current and future periods

When an entity **changes its method of depreciation, amortization, or depletion** of an asset, it is a change in accounting principle, but it is also a change in the estimate of how the entity is obtaining benefits from the use of that asset. As a result:

- A change in depreciation, amortization, or depletion method is accounted for **prospectively** like a change in estimate
- Since it involves a change in accounting principle, the entity must *justify the change* on the basis that the new method is preferable.